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# PLANETARY PHENOMENA FOR MARCH AND APRIL, 1916.

BY MALCOLM McNEILL.

## PHASES OF THE MOON, PACIFIC TIME.

New Moon .. Mar.	3, 7 <sup>h</sup> 58 <sup>m</sup> P.M.	New Moon... Apr.	2, 8 <sup>h</sup> 21 <sup>m</sup> A.M.
First Quarter "	11, 10 33 A.M.	First Quarter . "	10, 6 36 A.M.
Full Moon .. "	19, 9 27 A.M.	Full Moon.... "	17, 9 7 P.M.
Last Quarter "	26, 8 22 A.M.	Last Quarter.. "	24, 2 38 P.M.

The vernal equinox, the time when the Sun crosses the celestial equator from south to north, occurs March 20, 2<sup>h</sup> 47<sup>m</sup> P. M., Pacific Time. As the tropical year is about six hours longer than 365 days, the equinox in 1917 will come about six hours later; the same phenomenon will be repeated in 1918 and 1919, but in 1920, the next leap year, with the extra day, February 29, the time of equinox will drop back to nearly the time for the present year. As 1900 was not a leap year the date of the equinox during the latter part of the last century was about one day earlier than it now is.

*Mercury* is a morning star, reaching its greatest western elongation, 27° 6', on March 1. It then rises about an hour and ten minutes before sunrise and may be seen in the early morning twilight if the atmospheric conditions are good. The elongation is considerably greater than the average, as it occurs only eight days before aphelion. The occasions for naked-eye visibility of *Mercury* as a morning star during the winter months are not common. After greatest west elongation the apparent distance between planet and Sun gradually diminishes until superior conjunction is reached on April 14. The planet then becomes an evening star and moves eastward and northward relative to the Sun rather rapidly, so that by the end of the month it remains above the horizon considerably more than an hour after sunset, and it will be an easy object to see in the evening twilight. This condition will continue during the greater part of May. *Mercury* and *Uranus* are in very close conjunction March 4, 5 P. M., Pacific Time, the former being only 8' south of the latter. It will then be full daylight in the

United States, but they will still be quite close together on the following morning.

*Venus* is an evening star thruout March and April, in a very favorable position for observation, being above the horizon more than three hours after sunset on March 1, and this interval is increased to almost four hours by the end of April. The apparent distance between planet and Sun gradually increases until April 24, when the planet reaches greatest east elongation,  $45^{\circ} 39'$ . The planet will then set a trifle more than four hours after sunset, an unusually long interval, due to the combination of greatest elongation with a position considerably north of the Sun. This last is notably enhanced by the circumstance that *Venus* has just passed its "greatest heliocentric north latitude," that is, it is in that part of its orbit farthest above the Earth's orbit. During the two months' period the motion of the planet is  $67^{\circ}$  eastward and  $19^{\circ}$  northward from the eastern part of *Pisces* thru *Aries* to the eastern part of *Taurus*. During the early days of April it passes a little south of the *Pleiades*.

*Mars* has begun to lose the brightness which it had at opposition in February, but is still quite conspicuous and remains in good position for observation. On March 1 it sets a little before sunrise. Its setting time comes earlier and earlier each day, but the change is small, so that by the end of April it remains above the horizon until nearly 2 A. M. Up to March 22 its motion among the stars is slowly westward, about  $3^{\circ}$ . It then begins to move eastward, so that by the end of April it will have moved a little more than  $7^{\circ}$ . Its eastward path is south of the westward, and on April 30 it will be about  $2^{\circ} 30'$  south of the position it held on February 16. It moves from the constellation *Cancer* into *Leo*, and at the end of April is about  $8^{\circ}$  west and north of *Regulus*, the principal star of the constellation. From the first of March, when its brightness is only a little less than it was at opposition, up to the end of April its brightness diminishes nearly one and one-half magnitudes; but even at the latter date it will still be nearly twice as bright as *Regulus*, the first magnitude star near it. Its distance from the Earth increases from 67 to 110 millions of miles during the two months. On April 10 its distance from us is

## 28 *Publications of the Astronomical Society, &c.*

equal to the Earth's mean distance from the Sun. The planet reaches its aphelion, the greatest distance from the Sun, on March 3.

*Jupiter* on March 1 sets not quite two hours after sunset, but the more rapid apparent eastward motion of the Sun among the stars causes the distance between planet and Sun to diminish rapidly and conjunction occurs on April 1. As *Jupiter* is in the part of its orbit farthest south from the plane of the Earth's orbit, the planet will not pass behind the Sun, but about  $1^{\circ}$  to the south. *Jupiter* will now be a morning star and apparently recede from the Sun, but will also be several degrees south of the Sun, so that the interval between the rising of the planet and sunrise will increase rather slowly, being less than one hour on April 30, and the planet will not be an easy naked-eye object until well into May.

*Saturn* remains in good position for evening view thru March and April. It does not set until about three hours before sunrise on March 1. It sets about four minutes earlier daily, until by the end of April its setting time is about half an hour before midnight. Until March 11 its motion is westward in the constellation *Gemini*. It then resumes its eastward motion and by the end of April it is in nearly the same position it occupied at the end of January. It lies several degrees south and west of *Castor* and *Pollux*, the principal stars of the constellation *Gemini*. The appearance of the rings is about the same as in January.

*Uranus* is a morning star, rising about  $5^{\text{h}} 40^{\text{m}}$  A. M. on March 1, and four hours earlier on April 30. It is not in a very good position for identification, being in rather a barren region on the border line between *Capricorn* and *Aquarius*.

*Neptune* is in the evening sky in the constellation *Cancer*, but cannot be seen without the aid of a telescope.